NEGATIVE: Supersonic

By “Coach Vance” Trefethen

Affirmative plan removes ban on domestic supersonic air travel in the U.S. Although there are no planes currently operating, supersonic (traveling faster than the speed of sound) airplanes could legally travel on overseas routes. But they are prohibited from traveling over the US land surface, due to worries about noise. AFF believes supersonic air travel can be legalized now because new technologies are making it more economical and quieter. A company called "Boom Technologies" claims it can have one flying by the decade of 2020s. Neg strategy will be to show that it is not more economical, the noise problem has not been solved, and that we need to do more study before we do anything else.  
  
Note: "Mach" numbers refer to the speed compared to the speed of sound (767 mph). Mach 1 = speed of sound. Mach 2 = twice the speed of sound… etc.

Negative: Supersonic 3

MINOR REPAIR 3

1. Do Mark Sanford's "more study" proposal 3

There are still a lot of unknowns. Let's study it first and report back next year by passing a bill introduced by Rep. Mark Sanford 3

INHERENCY 3

1. Let Status Quo testing finish 3

Status Quo NASA project is working on quiet supersonic, we'll know in 2022 if it's working 3

SOLVENCY 3

1. No market / too expensive 3

Solving the noise isn't enough: They haven't solved the economics 3

Fuel costs are too high: Even 30% more efficient than Concorde, it will still be unaffordable 4

Concorde already tried and failed: Not enough "high rollers" willing to pay extra for supersonic travel 4

One prototype working isn't enough: Has to be economical to use on as many routes as possible, or airlines won't use it at all 4

A/T "Supersonic getting cheaper" – But subsonic is getting cheaper too, so the relative price is still too high 4

2. No consumer demand 5

Customers won't buy it: Supersonic can't provide the amenities consumers expect 5

3. Technology not ready 5

Big companies are not willing to spend their own money on it, and that proves it's not viable 5

Safe hypersonic (> Mach 5) travel will be ready 50 years from now… and it will still be too expensive to compete with regular planes 5

4. Insignificant benefit 5

Even if it works, the market for supersonic travel will be tiny 5

DISADVANTAGES 6

1. Noise 6

Sound problem has NOT been solved. "Boom Technologies" (new startup company) is still trying and so is NASA 6

Yes, even with new technology, there will still be extra noise for supersonic planes 6

2. Federal deficits and taxpayer ripoff 6

Link: AFF promotes research on supersonic air travel. 6

Link: NASA research on supersonic air travel is a taxpayer ripoff: helping the rich at the expense of everyone else 6

Impact: The Economy. Every increase in the federal deficit hurts the economy 7

3. Fuel consumption 7

Link: Even if "Boom Technologies" succeeds, it will consume 3 times as much fuel as current flights 7

Disad / Significance Dilemma: If they try to beat this disadvantage by claiming their plan is insignificant, then they deserve to lose 7

Link: Existing planes are bad on pollution… imagine what happens when we consume 3 times more 7

Impact: Nitrous Oxide (NOx) emissions kill people 8

Works Cited: Supersonic 9

Negative: Supersonic

MINOR REPAIR

1. Do Mark Sanford's "more study" proposal

There are still a lot of unknowns. Let's study it first and report back next year by passing a bill introduced by Rep. Mark Sanford

Kerry Lynch 2017 (journalist) " Congress Eyes Future of Supersonic Travel" 3 July 2017 (brackets added) <https://www.ainonline.com/aviation-news/business-aviation/2017-07-03/congress-eyes-future-supersonic-travel>

[South Carolina congressman Mark] Sanford’s measure calls on the FAA to “consider the needs of the aerospace industry and other stakeholders when creating policies, regulations and standards that enable the safe commercial deployment of civil supersonic aircraft technology and the safe and efficient operation of civil supersonic aircraft.” The measure directs the FAA to obtain stakeholder input on an appropriate regulatory framework and timeline to permit civil supersonic aircraft operations; issues related to standards and noise certification; operational differences between subsonic and supersonic aircraft; benefits of supersonic operations; and challenges with balancing economically reasonable policies with protecting the public from noise exposure. It further directs the FAA to report back to Congress within a year on its activities.

**Analysis: If the Affirmative is right and the problems are solved, then the Minor Repair will get it done next year. There's no rush because no supersonic aircraft is sitting in any hangar right now waiting to take off. But if AFF is wrong, then more study will help us avoid mistakes and create better policies.**

INHERENCY

1. Let Status Quo testing finish

Status Quo NASA project is working on quiet supersonic, we'll know in 2022 if it's working

Brett Williams 2017 (journalist) 24 July 2017 " NASA wants to bring supersonic commercial air travel to U.S. skies" <http://mashable.com/2017/07/24/nasa-quiet-supersonic-plane-bids/#lka6.QjQdmqA>

Peter Coen, the project manager of NASA's commercial supersonic research team (seen below), told Bloomberg that his team is aiming for a sound level between 60 and 65 A-weighted decibels (dBa), which is roughly as loud as the sound of a luxury car driving on the highway.  NASA plans to test the prototype X-plane in the airspace of up to six communities starting in 2022, according to the report. The agency will then share its design expertise and test results with major U.S. plane manufacturers to encourage the development of the supersonic tech.

SOLVENCY

1. No market / too expensive

Solving the noise isn't enough: They haven't solved the economics

Richard Aboulafia 2016 (vice president of analysis at Teal Group; manages consulting projects in the commercial and military aircraft field) "Speed Kills" SLATE <http://www.slate.com/articles/technology/future_tense/2016/04/why_planes_aren_t_getting_any_faster_and_won_t_any_time_soon.html>

Since Concorde entered service, there has been progress in reducing the noise footprint associated with supersonic travel. But the problem with supersonic flight has little do with the boom made by these jets. You could make the boom go away and still be faced with something less sexy: economics. Very little has been done, or could be done, to lower the high costs associated with high-speed flight.

Fuel costs are too high: Even 30% more efficient than Concorde, it will still be unaffordable

Joel Hruska 2016 (journalist) 16 Nov 2016 " Boom Technologies unveils its new supersonic jet prototype" <https://www.extremetech.com/extreme/239593-boom-technologies-unveils-new-supersonic-jet-prototype>

This efficiency gap could be the hardest issue to solve and may ultimately limit the XB-1’s usefulness. Improving the Concorde’s fuel efficiency by 30% would be an impressive gain, but it would still make the plane far more expensive than its modern competitors. With just 44 passengers on-board, the aircraft’s ticket price would be extremely sensitive to fuel prices. If Boeing has to pay 5% more for fuel, it can spread that cost over the 200-400 passengers on any given long-haul commercial flight. At $5,000 a seat, the XB-1 is already far more expensive than a conventional trip. While the difference is undoubtedly worth it for certain people, whether there’s enough of them to justify a major building effort is another question.

Concorde already tried and failed: Not enough "high rollers" willing to pay extra for supersonic travel

Richard Aboulafia 2016 (vice president of analysis at Teal Group; manages consulting projects in the commercial and military aircraft field) "Speed Kills" SLATE <http://www.slate.com/articles/technology/future_tense/2016/04/why_planes_aren_t_getting_any_faster_and_won_t_any_time_soon.html>

 Concorde, the roughly 40-year-old supersonic icon from the jetpack-and-flying-car era, offers a crucial lesson for anyone wishing to follow its footsteps. Thanks to high fuel burn and other high operating costs, supersonic travel calls for first-class ticket prices. Yet the number of those willing to pay the fare needed for supersonic flight is too small to justify such a jet in all but a handful of markets. It made sense for New York to Paris or London, but other markets simply don’t offer the critical mass of high rollers.

One prototype working isn't enough: Has to be economical to use on as many routes as possible, or airlines won't use it at all

BBC 2016. (journalist Stephen Dowling) 22 March 2016 "The American Concordes that Never Flew" <http://www.bbc.com/future/story/20160321-the-american-concordes-that-never-flew>

“The model that most airlines use means that they can’t have an airplane that they can only use on a few routes,” says Coen – if you’re going to use expensive supersonic aircraft, then you have to use them on as many routes as possible so they pay for themselves.

A/T "Supersonic getting cheaper" – But subsonic is getting cheaper too, so the relative price is still too high

Richard Aboulafia 2016 (vice president of analysis at Teal Group; manages consulting projects in the commercial and military aircraft field) "Speed Kills" SLATE <http://www.slate.com/articles/technology/future_tense/2016/04/why_planes_aren_t_getting_any_faster_and_won_t_any_time_soon.html>

So, every time a new generation of high-bypass engines is introduced on a subsonic aircraft, we move further away from supersonic travel economics, in terms of both technology and relative fuel burn. The efficiency difference between the subsonic jetliners of 1976 and Concorde was narrower than the difference would be between a conventional jetliner in 2020 and a next generation supersonic design. In other words, the difference between a subsonic ticket price and a supersonic ticket price will have increased, too.

2. No consumer demand

Customers won't buy it: Supersonic can't provide the amenities consumers expect

Richard Aboulafia 2016 (vice president of analysis at Teal Group; manages consulting projects in the commercial and military aircraft field) "Speed Kills" SLATE <http://www.slate.com/articles/technology/future_tense/2016/04/why_planes_aren_t_getting_any_faster_and_won_t_any_time_soon.html>

In other words, a passenger today has much less incentive to pay more to travel faster. He’s completely connected to his office, can enjoy the latest entertainment on a personal screen, and sleep in a (relatively) comfortable bed. He might even look forward to escaping the office in his well-provisioned cocoon. None of this was true in Concorde’s day. And a new supersonic jetliner, like Concorde, would probably just offer basic reclining seats. Space is at a premium on supersonic jets, due to the need to minimize drag.

3. Technology not ready

Big companies are not willing to spend their own money on it, and that proves it's not viable

Richard Aboulafia 2016 (vice president of analysis at Teal Group; manages consulting projects in the commercial and military aircraft field) "Speed Kills" SLATE <http://www.slate.com/articles/technology/future_tense/2016/04/why_planes_aren_t_getting_any_faster_and_won_t_any_time_soon.html>

The best indicator of the viability of fast transport concepts is a company’s willingness to spend its own cash. Those smaller aircraft involve private-sector money. The bigger concepts, by contrast, are purely funded with government cash. In the case of Lockheed Martin, this makes sense; the company is in the business of making weapons and surveillance aircraft that could use high-speed technology. But neither Lockheed Martin nor any other large aerospace contractor will spend any of its own money on large high-speed transport development. The risk-reward ratio is unattractive, at best.

Safe hypersonic (> Mach 5) travel will be ready 50 years from now… and it will still be too expensive to compete with regular planes

Richard Aboulafia 2016 (vice president of analysis at Teal Group; manages consulting projects in the commercial and military aircraft field) "Speed Kills" SLATE (ellipses in original) <http://www.slate.com/articles/technology/future_tense/2016/04/why_planes_aren_t_getting_any_faster_and_won_t_any_time_soon.html>

Eventually, after 50 years or so, safe hypersonic passenger transport will be feasible. At that point, we’ll merely have to contend with the enormous costs associated with this technology. And of course conventional jetliners will have continued on their path toward ever greater efficiency, meaning the ticket-to-cost ratio between fast and conventional air transport will be enormous.

4. Insignificant benefit

Even if it works, the market for supersonic travel will be tiny

Richard Aboulafia 2016 (vice president of analysis at Teal Group; manages consulting projects in the commercial and military aircraft field) "Speed Kills" SLATE (ellipses in original) <http://www.slate.com/articles/technology/future_tense/2016/04/why_planes_aren_t_getting_any_faster_and_won_t_any_time_soon.html>

Pursuing large supersonic and hypersonic transports may be futile, but some form of fast transport is inevitable. There will likely be a market for a supersonic business jet, such as the one [proposed by Aerion](http://www.aerionsupersonic.com/); the top end of the business jet market is virtually price inelastic. There may conceivably even be a market for a small supersonic transport (20-40 seats) that effectively skims off the world’s most elite airline traffic.

DISADVANTAGES

1. Noise

Sound problem has NOT been solved. "Boom Technologies" (new startup company) is still trying and so is NASA

Joel Hruska 2016 (journalist) 16 Nov 2016 " Boom Technologies unveils its new supersonic jet prototype" <https://www.extremetech.com/extreme/239593-boom-technologies-unveils-new-supersonic-jet-prototype>

The FAA banned the original Concorde from making overland flights because the sonic booms it created could be in excess of 135 decibels — as loud as a jet engine taking off from 100 feet away. NASA is working on designs that could cut the sound level down to 70 – 79 decibels, and while that’s still loud, it’s equivalent to a car passing nearby, not a jet engine running at full blast. For now, Boom Technologies is only planning over-water demonstrations, but if [NASA](https://www.extremetech.com/tag/nasa) can solve the sonic boom problem with its own ongoing X-plane research, it would give the supersonic industry far more available routes.

Yes, even with new technology, there will still be extra noise for supersonic planes

Sebastien Modak 2017 (journalist) 17 March 2017 "Supersonic Flight Is Around the Corner...But Why Is It Taking So Long?" <https://www.cntraveler.com/story/supersonic-flight-is-around-the-corner-but-why-is-it-taking-so-long>

When it comes to noise, you're still most definitely going to hear this thing. Dourado and Scholl made repeated references to the everyday din of city life—jackhammers, subway trains, motorcycles, car horns—claiming that "the complaints about sonic boom noise are overstated." Thanks to new technology, the Boom plane will be quieter than the Concorde (85 decibels, or about as loud as "the slamming of a luxury car door", versus 105) and NASA's contract with Lockheed Martin for a ["'low-boom' flight demonstration aircraft"](http://www.cntraveler.com/stories/2016-03-02/nasa-announces-plans-for-a-quiet-supersonic-jet)—supersonic speeds without the deafening thunderclap—is promising. But basic physics will tell you that if you're going above Mach 1, those sound-waves need to go somewhere. Plus, it could be argued that the FAA is protecting the most vulnerable: Those most affected by airplane noise pollution—the people who live outside the already-cacophonous city and on real estate near airports—[aren't necessarily the ones who have the economic means to stop it](http://ec.europa.eu/environment/integration/research/newsalert/pdf/air_noise_pollution_socioeconomic_status_links_IR13_en.pdf). Still, as long as the FAA ban holds, we may see supersonic flights rev back up, but at first they will only be for long-haul transoceanic trips.

2. Federal deficits and taxpayer ripoff

Link: AFF promotes research on supersonic air travel.

Link: NASA research on supersonic air travel is a taxpayer ripoff: helping the rich at the expense of everyone else

Richard Aboulafia 2016 (vice president of analysis at Teal Group; manages consulting projects in the commercial and military aircraft field) "Speed Kills" SLATE (ellipses in original) <http://www.slate.com/articles/technology/future_tense/2016/04/why_planes_aren_t_getting_any_faster_and_won_t_any_time_soon.html>

This raises the difficult question of NASA’s high-speed research. Much of the agency’s aeronautics research involves long-term technologies that potentially enable more efficient and clean flight. But then there’s NASA’s supersonic transport work, which basically aims to subsidize a tool for the wealthiest people in the world. As industry observers have noted before, “Mach 2 ... Taxpayers Zero.”

Impact: The Economy. Every increase in the federal deficit hurts the economy

Dr William Gale and Benjamin Harris 2011. (Gale - PhD in economics, Stanford Univ.; senior fellow at the Brookings Institution and co-director of the Urban-Brookings Tax Policy Center; former assistant professor in the Department of Economics at UCLA, and a senior economist for the Council of Economic Advisers under President George H.W. Bush; Harris - master’s degree in economics from Cornell University and a master’s degree in quantitative methods from Columbia University; senior research associate with the Economics Studies Program at the Brookings Institution) “A VAT for the United States: Part of the Solution” <http://www.taxanalysts.com/www/freefiles.nsf/Files/GALE-HARRIS-5.pdf/$file/GALE-HARRIS-5.pdf>

But even in the absence of a crisis, sustained deficits have deleterious effects, as they translate into lower national savings, higher interest rates, and increased indebtedness to foreign investors, all of which serve to reduce future national income. Gale and Orszag (2004a) estimate that a 1 percent of GDP increase in the deficit will raise interest rates by 25 to 35 basis points and reduce national saving by 0.5 to 0.8 percentage points of GDP. Engen and Hubbard (2004) obtain similar results regarding interest rates.

3. Fuel consumption

Link: Even if "Boom Technologies" succeeds, it will consume 3 times as much fuel as current flights

DENVER POST 2016 (article provided by Bloomberg News 4 Dec 201) Colorado-based Boom Technology is bringing back supersonic. But will the airlines buy it?) <http://www.denverpost.com/2016/12/04/colorado-boom-technology-supersonic/>

The biggest technical challenge, however, will probably be the engine, as noted in a recent analysis by Bjorn Fehrm, an aerospace consultant and a former fighter pilot in the Swedish air force. Fehrm estimated that the Boom design is likely to use about three times the amount of fuel per seat-mile than current flights between London and New York.

Disad / Significance Dilemma: If they try to beat this disadvantage by claiming their plan is insignificant, then they deserve to lose

If they argue this disadvantage of fuel consumption is insignificant because there will just be a few planes and hardly anyone will notice, then the plan is insignificant and not worth an hour and a half of our time to debate it. In other words, if the plan is insignificant, NEG wins. But if the results of the plan, and the resulting fuel consumption, are significant, then this Disadvantage will be significant too. AFF can take their pick but they will lose either on this significant Disad or for having an insignificant case.

Link: Existing planes are bad on pollution… imagine what happens when we consume 3 times more

Gar Smith 1997 (award winning investigative journalist) "Oil Spills in the Sky" Summer 1997 <http://www.earthisland.org/journal/index.php/elist/eListRead/oil_spills_in_the_sky/>

Transatlantic jets burn between 2.5 and 3 tons of fuel per hour. In 1988, commercial aircraft consumed an estimated 70 percent of all jet fuel (with military and business craft accounting for another 24 percent). The world’s aircraft currently produce about 3 percent of the carbon dioxide gases attributed to human activity. During take-off, a jumbo jet can devour 2 million liters (528,344 gallons) of air per second. In the first five minutes of flight, a commercial airliner can burn as much oxygen as 49,000 acres of forest produce in a day. According to Department of Transportation figures, flying a Boeing 747-400 from Washington, DC to San Francisco burns 17,232 gallons of jet fuel. (Fuel efficiency: 6.7 mpg.) A Boeing 747 averages 32 minutes taxiing, taking off and landing. During this time, it can generate 190 pounds of NOx – equal to the amount produced by driving a car 53,500 miles.

Impact: Nitrous Oxide (NOx) emissions kill people

SCIENCE DAILY quoting Univ. of Colorado-Boulder press release 2017. " Diesels pollute more than lab tests detect" 15 May 2017 " <https://www.sciencedaily.com/releases/2017/05/170515111557.htm>

Because of testing inefficiencies, maintenance inadequacies and other factors, cars, trucks and buses worldwide emit 4.6 million tons more harmful nitrogen oxide (NOx) than standards allow, according to a new study co-authored by University of Colorado Boulder researchers. The study, published in *Nature*, shows these excess emissions alone lead to 38,000 premature deaths annually worldwide, including 1,100 deaths in the United States.

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